

River Watch Citizen Monitoring Program Is Valuable Partner

by Joe Courneya, Red River Basin Institute, Center for Watershed Education



River Watch students work in teams using standard methods and protocols to perform monthly monitoring activities.

The Red River of the North watershed encompasses 45,000 square miles, including parts of three states (North Dakota, South Dakota and Minnesota) and one Canadian province (Manitoba). About 80 percent of the land within the watershed supports some form of agricultural production and is considered to have some of the most fertile soils in the world. These soils are an important economic resource for North Dakota and the Red River region.

Realizing the need to implement best management practices and monitor the region's surface water resources,

a citizen water monitoring program called "River Watch Citizen Monitoring Program" (RWCMP) was established in the Minnesota portion of the Red River in 1995. In 2003, with support and guidance from the North Dakota Department of Health (NDDoH), the International Water Institute (IWI) established RWCMP as a basin-wide program that includes citizen-based monitoring activities at selected locations in North Dakota. High school students and citizen volunteers at five high schools conduct monthly water quality sampling runs to collect information and data that support the NDDoH's water quality monitoring needs.

The RWCMP currently involves 37 schools. Five are located in North Dakota, three are in Manitoba and 29 are in Minnesota. The program has three main goals: (1) education -- training the next generation of watershed scientists, (2) leadership -- teens and citizens collecting and interpreting water quality data and (3) monitoring -- augmenting existing state and locally sponsored monitoring efforts using

established quality assurance/quality control measures and training.

To achieve these goals, the program focuses on five main objectives:

1. Develop a "sense of place" and "connection" to their local watershed.

(River Watch ... cont. on page 2)



River Watch teams use the same tools as watershed scientists. The collection of credible data is a key component of the Red River Basin River Watch Program.

2. Teach and train volunteers in standardized field-based, scientific, surface water quality monitoring methods.
3. Establish a connection between volunteers, scientists and faculty engaged in watershed science.
4. Promote local volunteers as information resources and practicing contributors to the resource management community.
5. Offer watershed education curriculum and activities using a "cross-curriculum" approach.

The RWCMP is a partnership under the leadership of the IWI. Schools and citizens commit to training and monitoring protocols established by the U.S. Environmental Protection Agency, the NDDoH and the Minnesota Pollution Control Agency. Local funding support for equipment and school expenses are provided by many local soil conservation districts and water boards in North Dakota and Minnesota. The Oak Hammock Marsh Conservation Center has taken the lead in working with Manitoba schools and citizens, making this a truly basin-wide program.

In North Dakota, the RWCMP is in need of additional funding to adequately support activities of the volunteers. The IWI is working with partners to document long-term program needs and to develop a strategy to build a sustainable basin-wide RWCMP.

Two North Dakota Watersheds Included in National Conservation Security Program

Two North Dakota watersheds -- the Upper Sheyenne and Upper Cannonball -- were among 110 across the nation recently invited to participate in the Natural Resource Conservation Service (NRCS) 2006 Conservation Security Program (CSP). This voluntary program is designed to reward farmers for conservation stewardship and improvements they have made to the soil, water, air and plant and animal life.

The CSP is part of the 2002 Farm Bill and was introduced in 2004 with the Lower Yellowstone watershed in western North Dakota and eastern Montana as an initial watershed. Payments for demonstrable ongoing stewardship activities will recognize many of those who undertook conservation on their own initiative and who care for the natural resources shared by all.



John and Judi Trygg, Burleigh County producers, signing first 2005 CSP contract in July 2005. Far right is JR Flores, NRCS State Conservationist.

The 2006 CSP will include a renewable energy component. Eligible producers will receive compensation for converting to renewable energy fuels such as biodiesel and ethanol, for recycling 100 percent of on-farm lubricants and for implementing energy production, including wind, solar, geothermal and methane production.



North Dakota Conservation Security Program Watersheds for 2006

A sign-up announcement will be published that will detail specific program requirements in the watersheds. The program will be offered each year on a rotational basis in as many watersheds as funding allows.

The NRCS held the first CSP sign-up in 2004. The recent announcement of the 2006 watersheds brings the total number of watersheds enrolled to 330 across the nation, covering 250 million acres that have been eligible for the program.

The Watersheds

Upper Sheyenne -- The Upper Sheyenne River subbasin covers about 1,252,400 acres, including parts of seven counties (Benson, Eddy, McHenry, McLean, Pierce, Sheridan and Wells) in the Red River of the North basin. There are 802 farms in the subbasin with commodities ranging from sunflower, canola, corn and soybeans and multiple small grain crops to beef cattle and swine.

Water Quality -- Six streams, lakes and reservoirs in the Upper Sheyenne subbasin are listed on the state's Section 303(d) TMDL list. These waterbodies do not meet water quality standards, and Total Maximum Daily Loads (TMDLs) will be developed. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

The six waterbodies are impaired by sediment, siltation, nutrients, dissolved oxygen and eutrophication. Sediment and nutrients are the



Water erosion carries sediment to nearby waterbodies. (photo courtesy USDA-ARS)

primary water quality pollutants impairing the watershed's streams and lakes. Cropland and stream bank erosion carries sediment to the waterbodies. The Sheyenne River also has a large number of livestock operations on or near the river, which are impacting water quality. In addition, six shallow aquifers are considered sensitive to nitrate and pesticide contamination.

The CSP will reward those land stewards who have installed conservation measures to address water quality issues such as erosion control, nutrient and pest management, grazing management and riparian buffers.

Upper Cannonball -- The Cannonball River subbasin covers about 1,006,900 acres, including parts of six counties (Adams, Billings, Grant, Hettinger, Slope and Stark) in the Missouri River/Lake Oahe basin. There are 605 farms in the subbasin with commodities ranging from wheat, sunflowers, corn and soybeans to beef cattle and swine.

Water Quality -- Five out of the eight waterbodies in this watershed listed on the state's Section 303(d) TMDL list are impaired by fecal coliform bacteria. The other three are listed for nutrients/eutrophication and biological indicators.

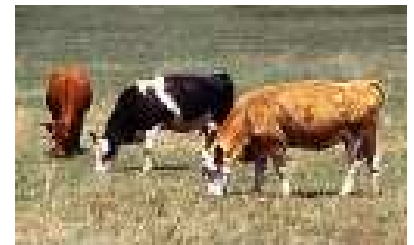
Agricultural wastes, sediment and nutrients are the primary water quality pollutants impairing the streams and lakes in the watershed.

The upper Cannonball River watershed has a large number of livestock operations on or near the river, creating nutrient loading and increased fecal coliform bacteria levels. A lack of adequate livestock grazing systems and feedlots are having an impact on the streams.

Conservation practices that can be used to address these water quality issues include grazing management, erosion control, nutrient and livestock waste management and riparian buffers.

For More Information

Additional information about the CSP, including eligibility requirements, can be found on the web at www.nrcs.usda.gov/programs/csp.



Livestock waste impacts water bodies in both the Upper Sheyenne and Upper Cannonball watersheds.

Taking the Pulse of Lake Sakakawea

by Peter Wax, Environmental Scientist, Division of Water Quality, North Dakota Department of Health



Sunset on Lake Sakakawea (photo by Jeff Hauge)

Are you looking for an all-expense paid, two-day "cruise" on beautiful Lake Sakakawea? While on the water, you will be treated to 10- to 12-hour days of either light winds and calm water, or hurricane gusts and 5-foot rollers. While "enjoying" all that Mother Nature has to offer, you will learn the art of collecting a myriad of water quality parameters at depths from 3 to 170 feet, followed by a rewarding game of "Pull that Anchor." If this type of experience appeals to you, I am always in search of new victims... I mean "volunteers."

For the past 14 years, the North Dakota Department of Health -- Division of Water Quality has been tracking the effects of the U.S. Army Corps of Engineers (COE) management of water levels on the volume of cold water habitat in Lake Sakakawea. Cold water habitat is defined as waters with temperatures of less than or equal to 15 degrees and dissolved oxygen concentrations

of greater than or equal to 5 milligrams per liter. Salmon and other forms of aquatic life rely on cold-water habitat for survival, and the loss of this habitat would have significant economic and environmental impacts.

The objective of this project is to collect enough surveillance data to document if, when and

how much degradation is occurring to Lake Sakakawea as a result of the COE's management of water levels. It is a violation of the state's water quality standards to pollute any lake or river, and pollution can be defined as any physical alteration that causes an increase in temperature or loss of dissolved oxygen.

Sampling consists of collecting dissolved oxygen, temperature, specific conductance and pH data at one-meter depth intervals from the surface to the bottom of the reservoir. Nutrients, general chemistry and biological parameters are collected at three depths. For the last three years, sampling has been shared with the



A view of Lake Sakakawea from the boat (photo by Peter Wax)

North Dakota Game and Fish Department's Fisheries Division. The COE periodically samples the same locations, and all agencies share the data.

As expected, the data show that as the lake levels fall, there is less cold water habitat available. However, there are many variables that affect temperature and dissolved oxygen. In order to address these variables, the Division of Water Quality has developed a tool for rapidly calculating cold water habitat volumes. With this tool, it is hoped a predictive model can eventually be created to streamline the tracking of cold water habitat, as well as to provide lake managers with the information they need to do a better job of managing Lake Sakakawea -- one of the greatest freshwater resources in the state, if not the country.

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Water Flows Through Devils Lake Outlet

by Mike Sauer, Senior Scientist, Division of Water Quality, North Dakota Department of Health

In August 2003, the North Dakota Department of Health (NDDoH) -- Division of Water Quality issued a permit to the North Dakota State Engineer to operate an outlet from Devils Lake. Two years later, the Devils Lake outlet became operational, and water from the West Bay of Devils Lake was released through the outlet and into the Sheyenne River.

The outlet will move water from the west end of Devils Lake to the Sheyenne River. The outlet is about 14 miles long and consists of two pumping plants, 10.3 miles of canal and 3 miles of pipeline. The pumps can pump a total of 100 cubic feet per second and are not able to pump if the level of Devils Lake is at an elevation below 1,445 feet mean sea level (msl). Current lake elevation is 1,448.34 msl. The outlet discharges into an abandoned oxbow of the Sheyenne River about 460 miles upstream of the Sheyenne's confluence with the Red River.

The discharge permit issued by the NDDoH contains strict water quality and flow limitations. When the permit expires at the end of June 2008, the division will evaluate all the data and determine if a renewal or modification to the permit is appropriate.

In 2005, the Council on Environmental Quality became involved with the outlet project at the request of the U.S. State Department after communications with Manitoba and Minnesota. The Council on Environmental

Quality coordinates federal environmental efforts and works closely with agencies and White House offices in the development of environmental policies and initiatives.

Manitoba and Minnesota were primarily concerned about biota transfer; however, Manitoba also raised issues about nitrogen and phosphorus loading to Lake Winnipeg. In regard to the nutrient loading, the NDDoH concluded that (1) the Devils Lake outlet would add only an inconsequential amount of the total load and (2) other sources of nutrients to Lake Winnipeg should be prioritized and targeted.

To address the issue of biota transfer, the Council on Environmental Quality orchestrated a collaborative effort with North Dakota, Minnesota, Manitoba, Environment Canada, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service to determine if 13 aquatic nuisance species were present in Devils Lake. While not designed to be a comprehensive study due to time limitations, the results of the July 2005 survey strongly suggested that the 13 species were not present.

The 13 species of concern included the following:

Aquatic macrophytes -- flowering rush, Eurasian water milfoil, curly leaf pondweed and brittle naiad

Aquatic invertebrates -- rusty crayfish, zebra mussels, Chinese mystery



Devils Lake's rising water has caused millions of dollars in damages. (photo by Mike Sauer)

snail, spiny water flea, an exotic daphniid, quagga mussel, New Zealand mud snail and an "exotic" amphipod

Fish -- striped bass

Fish pathogens and parasites that were found in Devils Lake also were known to be found in the Red River watershed.

Although not required by the permit, the State Engineer installed a rock and gravel intermediate filter designed to prevent macroscopic organisms from leaving Devils Lake and entering the Sheyenne River. The U.S. and Canada will cooperate in the design and construction of a more advanced barrier should it become necessary.

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